CCData Custom XRP Blended Price Index

CC Data Limited

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Contents

1 Version History

Version	Date	Details
1	Nov-2022	Initial version
2	14-Feb-2023	HitBTC removal as an Underlying Pair Eligible Exchange for XRP-USDT
3	14-Mar-2023	AAX and Binance removal as Underlying Pair Eligible Exchanges for XRP-USDT and XRP-USDC respectively
4	29-Mar-2023	CryptoCompare to CCData brand update
5	28-Apr-2023	Section 3.2 amendment to include 2-step FX conversion
6	10-May-2023	Changes to Underlying Pair Eligible Exchanges and Stablecoin-USD Pair Eligible Exchanges to reflect the CCData Exchange Benchmark Rankings as of April 2023
7	11-May-2023	Added Monthly Underlying Pairs Average Weights Table to Appendix
8	7-June-2023	Binance US removal as Underlying Pair Eligible Exchange for USDT-USD and USDC-USD
9	22-June-2023	Updated Monthly Underlying Pairs Average Weights Table to Appendix
10	9-September-2023	Coinbase added as an Underlying Pair Eligible Exchange for XRP-USD
11	26-September-2023	Bullish and Bybit added as Underlying Pair Eligible Exchanges for XRP-USDC
12	15-November-2023	Changes to Underlying Pair Eligible Exchanges and Stablecoin-USD Pair Eligible Exchanges to reflect the CCData Exchange Benchmark Rankings as of November 2023. Updated Monthly Underlying Pairs Average Weights Table to Appendix
13	19-December-2023	Binance removed from Underlying Pair Eligible Exchanges for XRP-BUSD. Binance and Bybit removed from BUSD-USDT Stablecoin-USD Pair Eligible Exchanges.
14	12-March-2024	Updated Monthly Underlying Pairs Average Weights Table to Appendix.
15	9-January-2025	Crypto.com and Bitget added to Underlying Pair Eligible Exchanges for XRP-USDT. Bitfinex and Kucoin removed from Underlying Pair Eligible Exchanges respectively for XRP-USD and XRP-USDC. Bitstamp removed from and Bullish added to USDT-USD Stablecoin-USD Pair Eligible Exchanges.

| 15 | 12-February-2026 | Moved Appendix to separate document. Updated contact details and added Exchange Selection and Review section and Disclaimer section. |

2 Definitions

24 Hour Volume means, with respect to an Underlying Pair or Stablecoin-USD Pair, an Exchange and a point in time, the sum of the volume of such Underlying Pair or Stablecoin-USD Pair on such Exchange over the last 23 calendar hours and the cumulative volume of the current calendar hour.

Blended Price Index means, with respect to a digital asset, a volume-weighted real-time price index for such digital asset that blends USD and certain stablecoin markets. It is calculated in accordance with Equation 1.

Exchange means, with respect to a Blended Price Index, an exchange that trades cryptocurrencies and is selected to contribute to such Index as an Underlying Pair Eligible Exchange and/or Stablecoin-USD Pair Eligible Exchange.

FX Conversion Index means, with respect to an Underlying Pair, a volume-weighted real-time FX conversion rate for the relevant Stablecoin-USD Pair. It is calculated in accordance with Equation 2.

Outlier Detection Factor means a factor used for penalising a price deemed to be an outlier in the Blended Price Index or FX Conversion Index calculation and is determined in accordance with Equation 4.

Stablecoin-USD Pair means, with respect to an Underlying Pair, the relevant stablecoin against USD. The respective Stablecoin-USD Pair for each Underlying Pair is specified in here.

Stablecoin-USD Pair Eligible Exchange means, with respect to a Stablecoin-USD Pair, each Stablecoin-USD Pair Eligible Exchange specified in here.

Time Penalty Factor means a factor used for penalising outdated prices in the Blended Price Index or FX Conversion Index calculation and is determined in accordance with Equation 7.

Underlying Pair means, with respect to a Blended Price Index, the USD market and each stablecoin market for the underlying digital asset that constitutes the Index. The complete set of Underlying Pairs for each Blended Price Index is specified in here.

Underlying Pair Eligible Exchange means, with respect to a Blended Price Index and Underlying Pair, each Underlying Pair Eligible Exchange specified in here.

UTC stands for Coordinated Universal Time.

3 Index Calculation

3.1 Blended Price Index Calculation

The CCData Custom XRP-USD Blended Price Index is calculated every time a new transaction is received on one of the eligible Exchanges. It is calculated in accordance with the following formula:

$$P_t = \sum_{u \in U_t} \sum_{e \in E_t^u} w_t^{u,e} \cdot p_t^{u,e} \cdot FX_t^u \tag{1}$$

Where:

t denotes a point in time, where the integer value represents seconds in unix timestamps [1];

P_t is the Blended Price Index value at time t;

u denotes an Underlying Pair in set U_t;

U_t is, with respect to the Blended Price Index, the set of all Underlying Pairs as specified in **??** in Appendix A;

e denotes an Exchange in set E_t^u;

E_t^u is, with respect to Underlying Pair u, the set of all Underlying Pair Eligible Exchanges;

$w_t^{u,e}$ is, with respect to Underlying Pair u, the weight assigned to Exchange e at time t and is calculated in accordance with Equation 3

$p_t^{u,e}$ is, with respect to Underlying Pair u, Exchange e and time t, the price of the last trade on such Exchange e; and

FX_t^u is, with respect to Underlying Pair u, the FX Conversion Index value at time t for the relevant Stablecoin-USD Pair calculated in accordance with Equation 2.

3.2 FX Conversion Index Calculation

With respect to each Underlying Pair, the FX Conversion Index value is the price of the underlying stablecoin in USD. For example, for Underlying Pair XRP-USDT, the relevant FX Conversion Index value is the price of USDT in USD. For the avoidance of doubt, if the quote currency of the Underlying Pair is USD, then an FX Conversion Index value is not applicable. The Index is calculated real-time in the same manner as the Blended Price Index described in subsection 3.1 but with the following changes:

- FX_t^u is now defined as the final index value at time t and omitted from the rest of the equation;

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[1]Therefore 0 represents 00:00:00 on January 1st, 1970 UTC.

- U_t is defined as the unit set of the relevant Stablecoin-USD Pair. For example, for Underlying Pair XRP-USDT, the set U_t would be the unit set containing USDT-USD.

By applying these changes, the FX Conversion Index formula for a given Underlying Pair u can be simplified as follows for the case when we have a direct pair:

$$FX_t^u = \sum_{e \in E_t^s} w_t^{s,e} \cdot p_t^{s,e} \tag{2}$$

Where:

t denotes a point in time, where the integer value represents seconds in unix timestamps;

FX_t^u is, with respect to Underlying Pair u, the FX Conversion Index value at time t;

s is, with respect to Underlying Pair u, the relevant Stablecoin-USD Pair;

e denotes an Exchange in set E_t^s;

E_t^s is, with respect to Stablecoin-USD Pair s, the set of all Stablecoin-USD Pair Eligible Exchanges;

$w_t^{s,e}$ is, with respect to Stablecoin-USD Pair s, the weight assigned to Exchange e at time t and is calculated in accordance with Equation 3; and

$p_t^{s,e}$ is, with respect to Stablecoin-USD Pair s, Exchange e and time t, the price of the last trade on such Exchange e.

Please note that if the direct Stablecoin-USD Pair is not available, then a two-step conversion via the Stablecoin-USDT Pair is applied.

3.3   Exchange Weight Calculation

With respect to Underlying Pair u or Stablecoin-USD Pair s, the weight of Exchange e at time t is calculated as follows:[2]

$$w_t^{u,e} = \frac{\mathbb{1}_t^{u,e} \cdot V_t^{u,e} \cdot \gamma_t^{u,e}}{\sum_{x \in E_t^u} \mathbb{1}_t^{u,x} \cdot V_t^{u,x} \cdot \gamma_t^{u,x}} \tag{3}$$

Where:

x denotes an Exchange (including Exchange e) in set E_t^u;

$\mathbb{1}_t^{u,e}$ is, with respect to Underlying Pair u, Exchange e and time t, the Outlier Detection Factor determined in accordance with Equation 4;

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[2]u may be substituted for s in Equation 3 and all subsequent Equations to calculate the applicable weight for a Stablecoin-USD Pair.

$V_t^{u,e}$ is, with respect to Underlying Pair u, Exchange e and time t, the 24 Hour Volume calculated in accordance with Equation 5; and

$\gamma_t^{u,e}$ is, with respect to Underlying Pair u, Exchange e and time t, the Time Penalty Factor determined in accordance with Equation 7.

The Outlier Detection Factor, with respect to Underlying Pair u, Exchange e and time t, is determined as follows:

$$\mathbb{1}_t^{u,e} = \begin{cases} 0 & \text{if } |E_t^u| > 2 \text{ and } (p_t^{u,e} > A \cdot P_{l_t} \text{ or } A \cdot p_t^{u,e} < P_{l_t}) \\ 1 & \text{otherwise} \end{cases} \tag{4}$$

Where:

E_t^u and $p_t^{u,e}$ are as defined above;

A is a constant that denotes the price deviation threshold; it is currently set to 1.05;

l_t is, with respect to t, the time of the last trade from any Exchange to contribute to the Blended Price Index[3]; and

P_{l_t} is the Blended Price Index value at time l_t.

The 24 Hour Volume, as defined in this document, with respect to Underlying Pair u, Exchange e and time t, is calculated as follows:

$$V_t^{u,e} = \sum_{h_t \leq \theta < t} v_\theta^{u,e} \tag{5}$$

Where:

h_t is, with respect to time t, the timestamp of the last calendar hour in UTC in the previous 24-hour period determined as follows:

$$h_t = t - (23 \cdot 3600 + c) \tag{6}$$

Where:

c is the number of seconds past in the current hour;

θ denotes a point in time between h_t (inclusive) and t (exclusive) for which there was a trade for Underlying Pair u on Exchange e; and

$v_\theta^{u,e}$ is the quantity traded of Underlying Pair u on Exchange e at time θ.

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[3]In the case of a Stablecoin-USD Pair, l_t and P_{l_t} would be with respect to the relevant FX Conversion Index.

The Time Penalty Factor, with respect to Underlying Pair u, Exchange e and time t, is determined as follows:

$$\gamma_t^{u,e} = \begin{cases} 1 & \text{if } \tau_t^e < 5 \\ 0.8 & \text{if } 5 \leq \tau_t^e < 10 \\ 0.6 & \text{if } 10 \leq \tau_t^e < 15 \\ 0.4 & \text{if } 15 \leq \tau_t^e < 20 \\ 0.2 & \text{if } 20 \leq \tau_t^e < 25 \\ 0.001 & \text{otherwise} \end{cases} \tag{7}$$

Where:

$\tau_t^{u,e}$ is, with respect to Underlying Pair u, Exchange e and time t, the length of time in minutes since the last trade on Exchange e calculated as follows:

$$\tau_t^{u,e} = \frac{t - l_t^{u,e}}{60} \tag{8}$$

Where:

$l_t^{u,e}$ is, with respect to Underlying Pair u, Exchange e and time t, the time of the last trade on such Exchange e to contribute to the Blended Price Index[4].

3.4 Outlier Detection

Along with the real-time outlier detection dictated by $\mathbb{1}_t^e$ in Equation 4, CCData will manually remove trades that are deemed outliers for other reasons, such as exchange errors.

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[4]In the case of a Stablecoin-USD Pair s, $l_t^{s,e}$ would be with respect to the relevant FX Conversion Index.

4 Exchange Selection and Review

Exchanges are selected and reviewed for each Underlying Pair and Stablecoin-USD Pair in accordance with the criteria below:

- The Exchange, as per CoinDesk Data Exchange Benchmark Report, must be Top Tier (Grade BB or above).

- The Exchange must be contributing to the CCIX Index for that Underlying Pair/Stablecoin-USD Pair.

- Each Underlying Pair Eligible Exchange must contribute at least 2% to the CCIX Index total volume for that Underlying Pair/Stablecoin-USD Pair over the last 90 days.

- Each Underlying Pair Eligible Exchange must contribute at least 1% to the Blended Price Index total volume over the last 90 days. [5]

Exchanges are selected and reviewed following the publication of each new Coin-Desk Data Exchange Benchmark Report, typically on a semi-annual basis.

CoinDesk Data reserves the right to implement changes outside of the scheduled review cycle where deemed necessary.

For a complete list of eligible exchanges, please refer to the latest CCData Custom XRP Blended Price Index Constituent Information here.

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[5]The requirement that each Underlying Pair Eligible Exchange must contribute at least 1% to the Blended Price Index total volume may conflict with the requirement to contribute at least 2% of the CCIX Index volume. In such cases, the 2% requirement will prevail.

5 Disclaimer

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